



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/713,647 | 11/13/2003 | Luan C. Tran | MI22-2429 | 1643 |
| 21567 | 7590 | 04/08/2004 | EXAMINER | |
| WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201 | | | GUERRERO, MARIA F | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2822 | |

DATE MAILED: 04/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/713,647

Applicant(s)

TRAN, LUAN C.

Examiner

Maria Guerrero

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30,31,36,37 and 39 is/are rejected.
- 7) ☒ Claim(s) 32-35 and 38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11-13-03
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office Action is in response to the Preliminary Amendment filed November 13, 2003.

Claims 1-29 are canceled.

Claims 30-39 are pending.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 30-31, 36-37, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gonzalez (U.S. 5,693,971) in view of Porter et al. (U.S. 5,901,078).
4. Gonzalez teaches forming a first memory cell including a first access transistor and a first data storage element, a first load electrode of the first access transistor being coupled to the first data storage element (capacitor) via a first storage node formed on a

Art Unit: 2822

substrate (Fig. 2A, col. 4, lines 1-15). Gonzalez discloses forming a second memory cell including a second access transistor and a second data storage element, a first load electrode of the second access transistor being coupled to the second data storage element via a second storage node formed on the substrate (Fig. 2A, col. 4, lines 1-15).

5. Gonzalez teaches forming first and second access transistors having first gate dielectrics with a first thickness (Fig. 2A). Gonzalez discloses forming an isolation gate between the first and second storage nodes and configured to provide electrical isolation therebetween (Abstract, Fig. 2A, 3, col. 4, lines 1-5). Gonzalez shows forming the isolation gate comprising a second gate dielectric (silicon dioxide) with a second thickness greater (may be up to twenty five percent thicker) than the first thickness used in at least the first and second access transistors (col. 4, lines col. 6, lines 1-10).

6. Regarding claims 30-31, 36-37, and 39, Gonzalez does not specifically show the isolation gate having a threshold voltage greater than the threshold voltage of the first and second access transistors. However, Porter et al shows that during normal operations of the DRAM devices the isolation gates have a threshold voltage greater than the threshold voltage of the first and second access transistors (col. 1, lines 24-40, col. 2, lines 1-25)

7. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Gonzalez reference by specifying the isolation gate having a threshold voltage greater than the threshold voltage of the first and second

Art Unit: 2822

access transistors as taught by Porter et al. in order to improve sensing accuracy (Porter et al., col. 2, lines 20-25).

Allowable Subject Matter

8. Claims 32-35 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: In the examiner's opinion, it would not have been obvious to a person of ordinary skill in the art to combine the cited references in order to obtain the specific thickness claimed and to form the isolation gate dielectric by filling the trench with dielectric material and polishing in combination with the other limitations of the claims because there is not motivation or suggestion. The cited references do not disclose or suggest implanting a halo implant in each of the access transistors only on a bitline contact side to provide a threshold voltage determined in part by the halo implant in combination with the other limitations in the claim.

Conclusion


9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yuzuriha et al. (U.S. 6,458,655), Harari (U.S. 4,417,325), and McLaury (U.S. 5,553,028) teach several steps pertinent to applicant's disclosure.

Art Unit: 2822

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 571-272-1837.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Maria Guerrero
Primary Examiner
April 1, 2004